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AUTHOR Hall, Richard H.
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ABSTRACT

A "connected classroom" model was used for an educational psychology class which relied heavily on both face-to-face and Web-based collaborative discussion. As part of the class, students were required to participate in collaborative discussion that consisted of a structured environment in which students addressed open-ended questions about foundational class material. Each week students completed a Likert questionnaire on which they were asked to rate their subjective reactions to both Web-based and face-to-face collaborative activities. Results indicated that: (1) for the majority of subjective questions asked, responses to the face-to-face versus Web-based collaborative learning did not significantly differ; (2) students found the face-to-face learning to be more socially positive, and they reported learning more about others in their group; (3) for Web-based discussion, students found discussions of opinion questions to be less effective for promoting learning than application questions; and (4) students' appreciation of group members' views and the amount they reported learning about other students decreased over the course of the class across both formats. (Author/AEF)

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Web-Based Conferencing as a Component of a Collaborative-Learning Based Educational Psychology Class

Richard H. Hall
University of Missouri – Rolla

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R. Hall

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Abstract

A "connected classroom" model was used for an educational psychology class, which relied heavily on both face-to-face and web-based collaborative discussion. As part of the class, students were required to participate in collaborative discussion that consisted of a structured environment, in which students addressed open-ended questions about foundational class material. Each week students completed a Likert questionnaire on which they were asked to rate their subjective reactions to both web-based and face to face collaborative activities. Results indicated that: a) For the majority of subjective questions asked, responses to the face to face versus web-based collaborative lerning did not significantly differ; b) Students found the face to face learning to be more socially positive, and they reported learning more about others in their group; c) For web based discussion students found web-based discussions of opinion questions as less effective for promoting learning than application questions; c) Students appreciation of group members views and the amount they reported learning about other students decreased over the course of the class across both formats.

Web-Based Conferencing as a Component of a Collaborative-Learning Based Educational Psychology Class

Knowledge interconnectivity has been identified by a number of theorist, researchers, and practitioners as a defining characteristic of expertise (Glaser & Bassok, 1989; Royer Cisero, & Carlo, 1993). As a result many have suggested that one of the ultimate goals of instruction should be to provide an optimal environment to promote the acquisition such knowledge. Knowledge interconnectivity can be thought of as "big picture" knowledge that emphasizes the pattern of relationships among foundational information within a given domain, and is sometimes referred to as structural knowledge. In order to emphasize such knowledge interconnectivity, I created a class design for my educational psychology class that I refer to as the "connected classroom". This design relies heavily on web-based and face to face collaborative learning techniques. Further, an effort was made to situate the class materials within simulated applied scenarios. Students and student teams were required to apply this information to questions about specific instructional scenarios, and to evaluate open-ended questions within the context of this foundational knowledge.

Figure 1 is a graphical depiction of the basic model of the educational psychology "connected classroom". For each section of the course students were first exposed to the foundational information in the form of a reading assignment. In order to motivate students to read this assignment they were quizzed over the materials. The principal application of these materials can be thought of as two basic tracks, represented by the middle rows in Figure 1. The Lesson track began with a lesson proposal from a team leader and an eventual presentation of the lesson. The discussion track included both web based and face to face collaborative discussion of issues related to the foundational material. Presumably the two tracks interact with one another in that students can apply things that come out of the lesson planning in collaborative discussions and vice versa. The collaborative discussion component of the model was the principal focus of this research.

A great deal of evidence indicates that face to face collaborative leaning can be a powerful learning tool if certain conditions are met, such as individual accountability (Johnson & Johnson, 1994), and adequate structure/guidance (Hall, et al. 1988; O'Donnell, 1996; Patterson, Dansereau, & Newborn, 1992). Not surprisingly, web-based collaboration also appears to show great promise. In fact, there may even be some advantages to web-based collaboration. For example, with collaborative learning via the web, the instructor can better control the dialogue assuring that all participants are accountable, and the anonymity of the web-based discussion may be particularly effective for encouraging socially anxious students to participate (McCollum, 1997). In fact, one question that has received little attention from educational researchers is whether or not the two formats differ, and, if so, in what ways are they different?

The collaborative learning based connected classroom provided a perfect vehicle for contrasting these two collaborative formats in that the same group of students

addressed questions related to the same foundational information in web-based and face to face cooperative groups.

In summary, this experiment set out to address two basic questions:

1. How do students' subjective reactions differ between collaborative discussion in a face to face classroom vs a web-based discussion environment?
2. How do students' subjective reactions to collaborative discussion change over the course of a collaborative learning based Educational Psychology class?
3. How do students' subjective reactions to collaborative discussion change across time as a function of the format (web vs face to face)?

Method

Participants

The participants were 17 students in a four-week undergraduate psychology class taught in the summer of 1998, at a medium sized science and technology oriented University in the Midwest. All but three of the students were female. They participated in the research as part of the requirement for the class.

Procedure

The course lasted four weeks. During the first week of the course students heard an introduction lecture, and were introduced to the *Discuss* (Paulisse & Polik, 1999) web-conferencing program, which was used for the web based discussion. They also were required to complete a reading assignment and took a quiz over the material. Students were assigned to four member teams, and these teams served both as a discussion group and as a support team for one member, who was required to present a lesson each week. During the first week of collaborative discussions, among other things, they decided on dates for doing the lessons. The data for this research were collected during the last three weeks of the class. Each of these three weeks (2, 3, and 4) was scheduled as follows:

Monday:

- Team leader for the week required to post a lesson plan on the discussion forum in the morning. This plan is available only to the student's team and the instructor.
- Students complete a quiz over the week's reading assignment.
- Students carry out a face to face discussion over open-ended questions related to the reading (see Table 1 for a list of the questions). Each student is required to address each question, and one student summarizes the group's responses to the whole class at the end of the class period. (This method of structured open-ended discussion is based on a method reported earlier (Hall & Mancini, 1997)).
- Team members are required to give feedback on the group leader's lesson plan by midnight.

Tuesday (class did not meet face to face):

- Instructor posts open-ended question(s) related to the reading on discussion forum in morning (see Table 2)
- Team leaders final lesson plan due by the afternoon, incorporating feed back from team and instructor
- Students required to post at least one message in their group's section of discussion forum in response to the instructors question, taking into account other group members comments by midnight.

Wednesday and Thursday:

- Students present lessons in class, with support of team members.

Students are required to turn in a Likert questionnaire by the end of the day Friday each week.

Materials

Students were required to turn in a 20 question Likert questionnaire that consisted of subjective questions about their collaborative discussion experience. The questionnaire consisted of ten statements about their subjective reactions to the collaborative discussions for both the web-based and classroom activities. They responded to each question with a rating of 1 to 10 that represented their agreement/disagreement with the statement. (Table 3 is as list of the questions they were asked.)

Results

The results consisted of a series of ten repeated measures analysis of variance. In each, week (2 vs 3 vs 4) and format (face to face vs web) served as within-subject independent variables and rating (agree/disagree) served as the dependent variable. Each ANOVA represented one of the ten questions.

A significant main effect for format $F(1,17)$, $p < .01$ was found in the ANOVA over question #3 ("I found the activity to be a positive social experience.") Students agreed more strongly with the question for face to face ($M = 8.31$, $SD = 1.60$) than for web-based discussion ($M = 6.40$, $SD = 2.52$). No other effects were significant

A significant main effect for week $F(2,34)$, $= 3.99$, $p < .05$, was found for question #4 ("The activity helped me to better appreciate the views of my group members.") The means and standard deviations for weeks 2 through 4 respectively were: $M = 7.92$, $SD = 1.71$; $M = 8.17$, $SD = 1.54$; $M = 7.44$, $SD = 2.07$.) Tukey's post hoc tests indicated that the mean for week two was significantly higher than the mean for week four, while the other mean comparisons were not statistically significant. No other effects were significant.

A significant week X format interaction $F(2,36) - 2.49, p < .05$ was found in the question 7 ANOVA ("The activity helped reinforce my learning of the reading material".) The descriptive statistics are displayed in Table 4. Tukey post hoc analyses consisted of a comparison of the two format means for each level of week. The two formats significantly differed for week three, but not for the other two weeks. No other effects were significant.

In the question #8 ("I learned a great deal about the way the others in my group think as a result of the activity") ANOVA a main effect was found for week, $F(2,34) = 7.19, p < .01$. The means and standard deviations for the three weeks from 2 to 4 were: $M = 8.11$, $SD = 1.56$; $M = 8.25$, $SD = 1.03$; and $M = 7.05$, $SD = 1.85$. In addition, a marginally significant effect was found for group $F(1,17) = 3.54, p = .07$, with students rating the face to face sessions higher $M = 8.35$, $SD = 1.38$ vs $M = 7.57$, $SD = 1.97$. No other effects were significant.

In the ninth ("The activity helped me to think more deeply about the readings, a marginally significant date X format interaction was found $F(2,36) = 3.01, p = .06$. The descriptive statistics for the cells in this interaction are displayed in Table 5. No other effects were significant.

No significant effects were found for the ANOVAS for questions #1, 2, 5, 6, and 10.

Discussion

Format

Over all there was not a substantial difference between the web-based and face to face groups in terms of student perceptions, in that, in only two of the ten questions were significant differences found directly as a function of format. Students rated the face to face discussions significantly higher as a positive social experience, further a marginally significant effect emerged ($p = .06$) on the question which asked students to rate how much they learned about "how the others in my group think". Students rated the face to face sessions as higher on both questions. On their surface, neither of these results seems surprising, since one would expect that a "social experience" includes not just language but facial expression, "body language", and the rich set of stimuli that make up the face to face interaction. All of these are absent in a group discussion on-line. Similarly, it's certainly logical that we would learn more about how others think by observing this same large set of stimuli as compared to simply reading their words on screen. However, it should be noted that the way the conferencing was carried out could have been changed in a number of ways, and many of these could have changed these effects. A fundamental change that could be made would be that the students could have carried on synchronous (chat) discussion which may have better paralleled the traditional give and take associated with a face to face interaction. Further, the students could have been required to respond more frequently and to respond to more questions, and, again, this

may have acted to partially narrow the perceptual gap between the two formats in terms of social experience and "group metacognition".

Week

An interesting main effect for week was found in two ANOVAs. Group members across both conditions reported appreciating the views of their fellow group members less, and understanding less about their ways of thinking as the weeks went on. Such an effect would seem counterintuitive given that we might expert the groups to become more cohesive and accepting of group members over the course of the class, On the other hand it is also quite possible that their views of their groups members, and their responses to their group members became more focused and more automated over time, such that they came to expect given views from the other members, while at the same time becoming more entrenched in their own positions.

Format X Week

In the "activity helped to reinforce my learning" ANOVA, the groups were similar for weeks two and four, but for week three there was a substantial drop for the web format. The explanation of this drop might very possibly lie in the question that students addressed this week in the Web Question (Table 2), quite independent of the format in which they answered this question. Students were asked to read materials over ADHD and Ritalin, a very controversial subject to say the least. Most likely the students mainly expressed their own previously held views, rather than making an effort to integrate information they read into their discussion, and, as a result, not much new learning occurred. This explanation is also supported by the marginally significant interaction ($p = .06$) found in the "think more deeply about the readings" ANOVA, in that, again, the lowest mean for those in the web-based group was for week 3. Due to their emphasis on supporting their own position, they may have spent little time analyzing and thinking deeply about new information they encountered.

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Table 1
Face to Face Group Discussion Questions

Week 2

1. a) To what extent do you consider yourself typically masculine, feminine, and androgynous (pg 178 of the text). b) Explain why and site examples if necessary.
2. According to the text, there is a great deal of sex bias in the classroom all through school. a) Is this consistent with your experience? b) Explain and site examples.
3. Some educators have begun placing males and females in different math classes. A) Do you think this is a good idea? b) Why or why not?
4. Do you believe schools should teach specific classes in learning and problem solving? Why or why not?
5. a) Describe some of the learning/study strategy techniques that you use that you have found to be most effective in college (be specific, and note different strategies for different types of classes if necessary). b) Describe some techniques that you found to be particularly ineffective.
6. Select a hypothetical topic that you are going to teach to a group of highschool students. Describe a cooperative learning exercise for teaching this topic, taking into account the five principles of effective cooperative learning listed on page 351 of the text (under "elements of cooperative learning groups".)

Week 3

1. a) Identify an instructor that you've had in your school experience who you found motivational. b) Explain what the instructor did that increased your level of motivation.
2. Pretend that you are teaching a highschool class in World History. Describe an activity you would use to increase students' motivation
3. a) Pretend you are a college instructor teaching and educational psychology class. b) Describe a student-centered activity for learning about Bloom's taxonomy.
4. a) Americans rank discipline problems in public schools as one of the biggest problems in education today. b) Why do you believe this is true? c) What do you believe should be changed to solve the problem?

Table 1 (continued)

5. a) Identify an instructor who you had who was a good lecturer. b) What were the characteristics of his or her lectures that made them effective?
6. a) Do you believe the "group consequences" method is a good way to control behavior in the classroom? b) Why or why not?

Week 4

1. Do you agree with the book that the principle characteristics of a good teacher are teachers knowledge, organization, and warmth/enthusiasm? Why or why not? What other characteristics would you add?
2. The "point counterpoint" on page 210 of the texts is a debate on whether or not high risk students should get more basic/traditional/direct instruction. Describe your opinion on this issue.
3. a) Describe an instructor who you believe used effective methods of assessment in determining grades in a class you were in. b) Describe an instructor who you believe used ineffective methods of assessment in determining grades in a class you were in. c) Describe the characteristics of each of these instructors in terms of general principles of effective versus ineffective assessment.
4. a) Which types of tests do you prefer: multiple choice or essay? b) Why? c) Which do you think are the best measures of learning? d) Why?
5. a) Do you believe that instructors should use more "authentic assessment" approaches such as portfolios and exhibitions? b) Why or why not?

Table 2
Web-Based Conferencing Questions

Week 2

1. a) Select a hypothetical topic that your are going to teach to a group of highschool students. b) Describe a cooperative learning exercise for teaching this topic, taking into account the five principles of effective cooperative learning listed on page 351 of the text (under "elements of cooperative learning groups".) (Be Specific)
2. Taking into account the elements of the constructivist perspectives (page 346 – in text), describe a constructivist type of activity for the same lesson topic that you described in #1 (use something besides cooperative learning). (Be Specific)

Week 3

First, read the two web pages that you can reach by clicking on the buttons below (you only need to read the page, but you can click on other links if you want) then use the back button to get back to this page, and answer this question:

Table 2 (continued)

1. a) If you were a parent, and your child was having severe discipline/attention problems in school, and had been diagnosed as having at attention deficit hyperactive disorder (ADHD), would you allow the child to be put on Ritalin (Methylphenidate?) b) Why or why not?

Week 4

1. a) Identify a general or specific educational topic. (If you're an ed major, this should be a subject you would teach, and, if you're not, it should be a subject associated with your major. You can use the same thing that you taught about in your class lesson). b) Identify a grade level, with junior high as a minimum. c) Describe in some detail an "alternative assessment" method that you would use to assess student learning of your topic. (This does not have to be a method described in the book, it simply has to be something different from "traditional" assessment).

Table 3
Subjective Ratings Questions

1. I found the activity to be fun and enjoyable.
2. The activity helped me to relate the readings to my everyday life.
3. I found the activity to be a positive social experience.
4. The activity helped me to better appreciate the views of my group members.
5. I found the activity to be a positive learning experience.
6. The activity helped me to better understand my own way of thinking.
7. The activity helped to reinforce my learning of the reading material.
8. I learned a great deal about the way the others in my group think as a result of the activity.
9. The activity helped me to think more deeply about the readings.
10. I experienced a great deal of anxiety and nervousness during the activity.

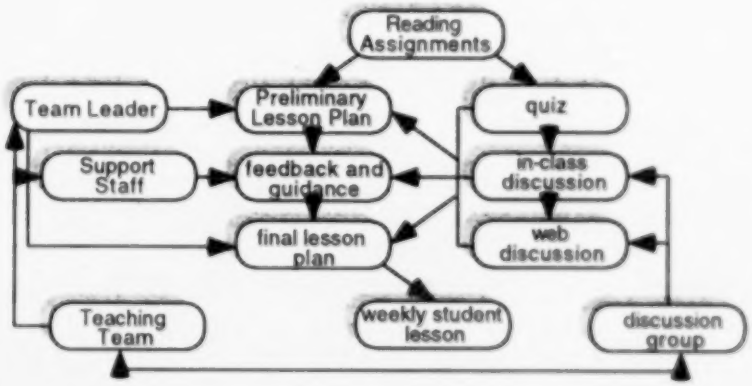
Table 4 Subjective rating of "The activity helped to reinforce my learning of the reading material." as a function of Format and Week.

	Format			
	Face to Face		Web	
Week	M	SD	M	SD
Two	8.05	1.35	8.16	1.50
Three	8.05	1.68	7.11	1.91
Four	7.68	1.64	8.16	1.43

Table 5 Subjective rating of "The activity helped me to think more deeply about the readings." as a function of Format and Week.

	Format			
	Face to Face		Web	
Week	M	SD	M	SD
Two	7.63	1.38	7.95	1.87
Three	7.53	1.68	7.16	1.98
Four	6.95	1.72	7.74	2.05

Figure 1: Class Model



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